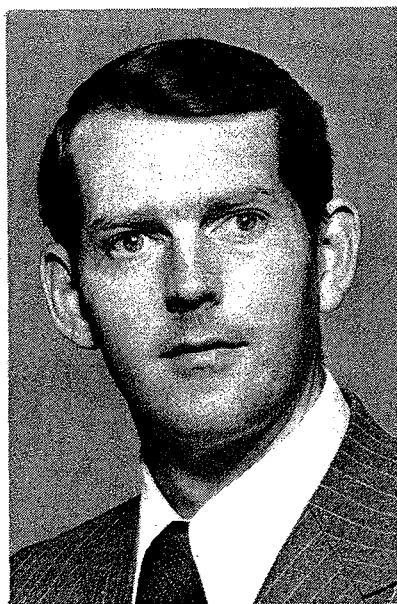


COST BENEFIT ANALYSIS, TRADITIONAL VS. ADULT STUDENTS

by Charles T. Muse

The adult students who were the minority in the undergraduate classrooms in the United States have increased and in some cases constitute a majority. More of the students at our colleges and universities are older, and, in many institutions, they represent the majority of students (Shearon, 1976). The college student is no longer the 17 to 23 year-old, which Hartnett defines as the traditional college student (Hartnett, 1972). According to the Current Population Reports, 1975, 48 percent of all college students are more than 21, with 10.4 percent of the students more than 35 years of age. In 1974, the college population beyond the age of 21 increased by 81.1 percent over the previous year (Hameister, 1977).

The future of higher education may hinge on colleges' and universities' ability to become more committed to lifelong learning and to eliminating existing barriers. From an institution's point of view these barriers can be viewed as three major problems: the access, the finance, and goals (Vermilye, 1974). In studying the barriers of traditional education, Cross and Jones found that cost was mentioned most frequently by adults of all ages as the major obstacle to traditional education (Cross, 1972). Likewise Carp, Peterson, and Roelfs, in their survey of potential students, found that cost was the most widely reported obstacle to attending educational institutions. Cost, including books, learning materials, child care, transportation, as well as tuition, constituted 53 percent of the barriers to attendance (Carp, 1974).



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Research literature of cost-benefit analysis of college programs examines the costs, benefits, and rates of return for both the individual student and society. The student populations that have been studied in the past were considered as one group with traditional student characteristics. The hypothesis for this study were designed to introduce the dichotomy of traditional vs. adult students and to test differences between the individual costs, benefits and rates of return of traditional and adult students. The purpose of the study was to estimate the individual costs and benefits of traditional and adult undergraduates of North Carolina State University, to estimate the undergraduates' individual rates of return and, with major emphasis, to ascertain any differences in costs, benefits, and rates of return between traditional and adult students. "Traditional students" were defined as the 18 to 23 year-old students, excluding the 23 year-olds with an interruption in education. Students 23 years old with an interruption in education, for example military service, do not fit the stereotyped "traditional student" mold and were considered to be "adult students." "Adult students" were the 23 years of age or older student, excluding the 23 year-old with no interruption in education.

METHOD

Subjects and Instrumentation

The population was the Spring 1977 bachelor degree recipients of State University. The population totaled 1,471, with 902 or 61 percent responding to the annual survey of degree recipients. Of the 902 respondents, 405 or 28 percent of the degree recipients reported starting salaries and were included in the cost-benefit analysis. Of the 405 graduates that were included in the study, 109 or 27 percent were considered to be adult students.

The survey questionnaire, Survey of May, 1977 Degree Recipients at State University, was developed and distributed by the Planning and Research Office of Student Affairs. This survey provided the age of the students and salary data needed to determine individual benefits. Transcripts of the ninety-two 23 year-old students of the population provided information needed to determine continuous or interrupted education in grouping the traditional and adult students. The transcripts indicated military service and any other interruption in the traditional four year college time frame.

Procedure

A cost-benefit analysis was used to estimate the individual costs and benefits incurred by the bachelor degree recipients of the Spring 1977 graduating class. Additionally, the study estimated the individual rates of return.

This study utilized the basic steps of a cost benefit study. First, the costs were determined. Individual costs were determined by totaling the direct and indirect expenditures of the graduates for their four years at State University to include tuition, fees, books, supplies and the foregone earnings (See Table 1). Foregone earnings were obtained from the U. S. Department of Commerce's Census of Population. In determining the private costs of each of the eight Schools at State University, a random sample of curricula was utilized (see Table 1).

Table 1. — Private costs and private benefits of traditional and adult students by school^a

Schools	Tuition and Fees	Books	Supplies	Foregone Earnings	Private Costs ^b	Foregone Earnings 1977-78	Starting Salary 1977-78	Private Benefits
<i>Agriculture</i>								
Traditional	\$2,334	\$565	\$200	\$22,235	\$26,334	\$6,240	\$ 9,129	\$2,889
Adult	2,334	565	200	23,244	26,343	7,280	10,900	3,620
<i>Design</i>								
Traditional	2,334	384	456	23,235	26,409	6,240	8,441	2,201
Adult	2,334	384	456	32,989	36,163	8,896	10,660	1,764
<i>Education</i>								
Traditional	2,334	500	200	23,235	26,269	6,240	9,479	3,239
Adult	2,334	500	200	23,244	26,278	7,280	10,771	3,491
<i>Engineering</i>								
Traditional	2,334	661	265	23,235	26,496	6,240	13,495	7,255
Adult	2,334	661	265	23,244	26,504	7,280	13,678	6,398
<i>Forest Resources</i>								
Traditional	2,234	551	200	23,235	26,320	6,240	12,073	5,833
Adult	2,234	551	200	23,244	26,329	7,280	12,420	5,140
<i>Humanities</i>								
Traditional	2,334	563	200	23,235	26,332	6,240	9,703	3,463
Adult	2,334	563	200	27,726	30,823	8,320	12,464	4,144
<i>Phys. & Mat. Sciences</i>								
Traditional	2,334	645	221	23,235	26,435	6,240	13,761	5,441
Adult	2,334	645	221	27,726	30,926	8,320	13,762	5,442
<i>Textiles</i>								
Traditional	2,334	663	228	23,235	26,460	6,240	12,374	6,134
Adult	2,334	663	228	23,817	27,042	7,280	12,340	5,060

^aFigures are in 1977 dollars.^bPrivate costs for four years of education at State University.

The second step was to determine the individual benefits of these graduates. The individual benefits were based upon the income differences of college graduates and high school graduates. High school graduate income was obtained from the U.S. Department of Commerce's Census of Population. Finally, the individual rates of return for the eight schools were determined. Utilizing the following equation and the Statistical Analysis System facility, individual rates of return for graduates of the eight schools were calculated:

$$\sum_{t=1}^n \frac{R_t^h - C_t^h}{(1+r)^t} = 0.$$

where R_t^h is the present value of private benefits in year t of school h , C_t^h is the present value of private costs in year t of school h , and r is the rate of return that equates costs and benefits. In sum, the private rate of return is a discount rate such that the present value of benefits and costs are equal.

In the analysis of variance, for each of the three variables (individual costs, benefits, and rates of return) there is a two-way classification. One factor (student type) has two levels and the other factor (school) has eight levels.

The SAS Procedure ANOVA produces F tests and levels of significance. The procedure was employed to determine differences, if any, between the student type for each of the three variables and among the schools for each of the three variables.

RESULTS

A significant difference existed between the individual costs of traditional students and adult students ($F=23.06$, $P<.002$). There was no significant difference due to the factor, school, among the eight schools at North Carolina State University ($F=1.00$, $P<.499$).

There was no significant relationship between individual benefits of traditional and adult students ($F=.67$, $P<.4398$), or between the individual rates of return for traditional and adult students ($F=3.16$, $P<.1189$) due to the factor, student type, between adult student vs. traditional student. There was a significant difference between individual benefits ($F=9.64$, $P<.0039$) and rates of return of traditional and adult students ($F=11.63$, $P<.0022$) due to the factor, school. The difference between individual benefits and rates of return of traditional and adult students was accounted for by the variations in starting salaries and rates of return for the eight schools.

The results of the study indicate that the individual costs for adult students are greater than the individual costs for traditional students in each of the eight schools (See Table 1). Furthermore, the analysis of variance shows that while there is a significant difference, significant at the .002 level, between the individual costs of traditional and adult students, there was no significant difference due to schools.

The findings of the study also suggest that the individual benefits and the rates of return for adult students are no greater than the individual benefits and rates of return for traditional students. The individual benefits for adults were greater in schools of Agriculture and Life Science, Education, Humanities Social Sciences (See Table 1). However, the analysis of variance identified no

significant differences between the individual benefits of traditional and adult students. There was evidence that the variations in individual benefits were due to the factor of school; the F value of 9.64 was significant at the .0039 level.

The individual rates of return for adults were greater in the schools of Agriculture and Life Science, Education, Humanities and Social Sciences. Nevertheless, the analysis of variance identified no significant differences between the individual rates of return of traditional and adult students. However, there was evidence that the variations in individual rates of return were due to the school factor. The F value of 11.63 was significant at the .0022 level (See Table 2).

Table 2. — Rates of Return of Traditional and Adult Students by School^a

School	Rate of Return	
	Traditional	Adult
Agriculture	9.4%	11.5%
Design	7.2%	3.2%
Education	10.5%	11.2%
Engineering	20.3%	18.4%
Forest Resources	17.2%	15.5%
Humanities and Social Sciences	11.1%	11.3%
Physical and Mathematical Sciences	20.9%	14.3%
Textiles	17.8%	15.0%

^aThis population includes all students that reported a starting salary.

CONCLUSIONS AND IMPLICATIONS

The results of this study suggest that the adult student incurs greater costs than the traditional student when investing in a four-year college degree, and that even with a greater starting salary than the traditional student, the adult cannot recover from the greater costs and shorter life stream of earnings, and thus receives a small benefit and rate of return for the investment. The results support Carp, Peterson, and Roelf's (1974) and Cross and Jones' (1972) contention that educational costs represent a major obstacle to the adult student.

The findings of the study also support Webb's (1976) contention that foregone student income is by far the largest cost of college education. This contention appears to have a greater effect on the adult. The adult student is older, more mature, and has certain life experiences. These combined factors command for the adult a greater salary in the labor market. Therefore, the the adult must give up a much greater salary than the traditional student to participate in a traditional college program. Additionally, there appears to be a direct relationship between the age of the student and the foregone income. As the student increases in age, so does the foregone income.

The State University rates of return for adult and traditional undergraduate students were not in the 9 to 14 percent range that are suggested by Becker (1964) and Bowen (1977). The rates for adult students range from 3.2 percent in the School of Design to 18.4 percent in the School of Engineering. The rates for traditional students range from 7.2 percent in the School of Design to 20.9

percent in the School of Physical and Mathematical Sciences (See Table 2). Only three of the eight schools fall within the range, with one school below the range and four schools above the range.

The implications of this study for practice focus on an educational institution's responsibility to funding sources and to their students. Cost-benefit analysis is a practical method that can be utilized by senior colleges, community colleges, technical institutes and various other adult education institutions to determine the individual and social costs, the individual and social benefits, and the rates of return of an institution's programs.

State University, like numerous other institutions of higher education, is feeling the pressure to become more accountable to funding sources and more accessible to adult students. To meet the needs of adult students, State University and other institutions of higher education need to address and minimize the barriers, particularly the cost barrier, facing these students. Institutions of higher education may need to implement more non-traditional programming that would allow adults to participate without having to incur great costs such as foregoing much or all of their income.

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